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CANCER: THOUGHTS ON.

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CANCER and its treatment presents many suggestive questions. Our present knowledge of its pathology and treatment is indeed very meager.

While we consider the subject for a little time I ask that you drop preconceived opinions, and remove any and all prejudice, that we may study the real scientific or pathological history of cancer as we find it to-day. Preconceived opinions, unless founded upon facts, are of no real value.

Every disease save that of cancer is practically on the decrease, while cancer is on the increase, and to such an extent that it will before long give us a mortality annually greater than consumption and typhoid fever combined. In 1890 its death-rate in the United States was 18,536. In 1900, or ten years later, it had increased nearly one-third, or, in round numbers, to 29,475. We find that after having passed the age of forty-five one out of every twelve women and one out of every twenty-one men die from this most dreaded malady. In 1900 the city of New York gave a mortality of 724 men and 1336 women who perished from cancer. In 1900 there were 29,475 deaths from cancer in the United States, or a death-rate of 60 per 100,000 population. Upon the same basis England produced a death-rate of 82, Ireland 61, Prussia 61, Holland 91, and Norway 84. In one decade it has increased 30 per cent. Professor Parks, of Buffalo, N. Y., claims that if this ratio of deaths continues until 1909 we shall have a greater mortality from cancer than that given by consumption, smallpox and typhoid fever combined.

Some fifty years ago cancer produced 1 death in 129; to-day it is 1 in 25 or 30. This suggests sober, earnest thought at the hands of the medical profession. Evidently cancer has a separate and distinct individuality not yet brought into our field of vision.

The world's greatest pathologists have studied and investigated along this line for ages, but to-day the outlook presents nothing hopeful or flattering. The outcome of investigation and discussion has produced two classes in the medical profession—one that holds directly to the idea of heredity, while the other couples infection and contagion with heredity.

In this discussion it is not my desire to take a positive stand with

that class of scientists who claim that there is nothing in the question of heredity. It is my candid opinion that a very large per cent. of all cases are the result of contagion or infection. From a statistical standpoint we could cite a large number of cases which give no evidence whatever of heredity. I have not the time nor the desire to thus impose upon your good nature.

What is the source of the contagion? Twenty-one years ago Sir James Paget said: "I believe that microbe parasites, or substances produced by them, will some day be found in essential relation with cancer and cancerous diseases." Hundreds of years before this time cancer was looked upon and believed to be due to a crab which was eating up the tissues. Were not the people in fact reckoning far better than they knew? We believe it is due to an animal so exceedingly small that it can only be recognized by the aid of a good microscope. This animal belongs to one of the lowest forms of life, an Ameba. We sometimes call it the proteus animalcule. It is found in the mud, ponds and pools of stagnant water. Under the microscope it appears transparent and resembles in form jelly. It has an outer and inner substance. The octoplasm is very transparent; the endoplasm presents a grayish tinge, probably due to minute solid particles, and is termed granular. It is undigested particles of food which the ameba has eaten, combined with bubbles of water. By close observation we can see the expanding and contracting of the body in taking food. The ameba has what is termed pseudopodia, or false feet. When they come in contact with anything desired as food it throws out the feet beyond the object, literally engulfing it. Having secured the prey, a little water is thrown out of the surrounding protoplasm with the food. Doubtless upon examination we would find some secreted substance which acts upon the prey and converts it into the necessary condition for its use. If we expose the ameba to conditions unfavorable, such as a dry atmosphere, it will enclose itself in a cyst and become sphere shaped. In this condition it can be carried about like a particle of dust.

A test of some thirty cases of cancer was made, which resulted in the discovery of an ameba which did escape the notice of the old investigators. The granular bodies were noted and mentioned as far back as the use of the microscope in the investigation of cancer. They were looked upon as broken or degenerated tissue. They were found in the blood-vessels and tissues of the individual infected with cancer, and frequently quite remote from the seat of the disease.

The ameba may be in the blood circulation of many, and yet, if every cell in the body remains normal as to its resisting power, it will overcome any and all attacks of the cancri-ameba. But in the event of lowered vitality from injury, bruise, or any cause whatever, these cells at once become weakened in their ability to resist, hence cannot repel an attack of the enemy; in a word, the nucleus of the disease is established.

How do these cancri-ameba reach the weakened spot? By riding upon or following the blood current. When once established in an epithelial cell its strength is more vigorous. It will then have the power to attack and overcome cells which have a greater integrity. It is found that these spores, even before they have separated from the parent, send out pseudopodia that prey on the epithelial cells which they come in contact with. Nature is ever ready to meet these threatened attacks, and as soon as the cancri-ameba opens battle the neighboring cells take on increased activity, multiplying and becoming more gigantic. This accounts for the proliferation of cells in the vicinity of the malignant tumor. The active cells press on those of the cancer from without, while the cancri-ameba crowd from within, and we have as a result flattened cells.

The battle for existence doubtless produces that hardness characteristic of cancer. The harder the cancer the slower its growth. In the encephaloid variety nature makes but little objection, hence a more rapid termination.

It is a sad fact, yet nevertheless true, that the best fortifications of cells are finally penetrated and crumble before their antagonist. This opens up a field for the leucocytes. The hardened mass shows evidence of softening, then follows an ulcerative surface. Upon this surface, by the aid of the microscope, we are able to detect the dead and dying from both sides. Now the leucocytal vultures will consume them.

The results given above are not always true, for the cell life may be so active and effective that the cancri-ameba will be effectually imprisoned and die from inanition. Should this result be produced the hard tumor formed will be cared for by nature, diminishing in a degree, and finally remaining stationary. This could with propriety be called nature's cure of cancer. Now and then nature produces a like cure in phthisis pulmonalis by throwing a wall of calcareous material around a nest of tubercle bacilli, and they also perish from starvation.

In the formation of cancer, if connective tissue prevails we have what is termed hard cancer; if epithelial cells, we have soft cancer;

and between the two extremes there are many grades. It may be said that in this warfare the normal cells are going wrong. This cell growth, as I have stated, is usually rapid and soon produces pressure upon the nerve or nerves, which in time will excite pain. Soon after this stage is reached comes the breaking down of cell-tissue. This condition continues until the parts are destroyed or death from hemorrhage results. Not infrequently these cells break loose from their moorings and are carried with the blood current, the leucocytes being unable to resist or destroy them, when at last they settle down in a new field, there to grow and multiply, sending their branches in every direction. The lymphatic glands sooner or later show infection, then the vital organs—stomach, lungs and liver, until all adjacent tissue has been fully impregnated with the virus.

The frequency of cancer excludes the idea that all cases are hereditary; further, we do not hesitate to say that it has been demonstrated by incontrovertible facts that the disease is contagious and infectious: (1) We believe that cancer is not influenced by climate, rainfall or elevation; (2) the various articles of food when taken have no bearing; (3) neither malaria nor tuberculosis change the per cent. of death; (4) a greater susceptibility exists in certain races, especially the Teutonic and Scandinavian.

We must next consider the question of environment and habits of the people. Do they play an important part in the production of cancer?

People in the European countries, who consume the greatest amount of beer, produce the greater rate per cent. of deaths. Doctor Arnault found, upon one street in Normandy, seventeen houses which gave twenty-one cases of cancer. In his opinion they were the result of contagion and infection. The people of America furnish a very large mortality rate among cancer nurses.

We have a class who claim that the origin of cancer is a low state of cell activity. If a wound or blow is received by such individual it would be sufficient to produce cancer development, as the cells are too weak to heal; that with age comes a loss of vital forces and cell vitality. This condition may be assisted by sedentariness, overwork, mental anxiety, impure air, want of sleep and rest or a lack of outdoor exercise. The body must be kept in a healthy condition, good assimilation and metabolism, good full respiration and oxygenation, with the elimination of waste products.

We have touched upon the points suggested by the two rival schools; let us now consider the ideas that seem to prevail at the

present time as to the pathology and history of cancer. By laboratory experimentation it has been demonstrated that cancer may be endemic in animals. Desiring to ascertain facts along this line, Hanan, Burrell, Michales, Loeb and many others entered the field of investigation. The results of their experiments were of such a nature as to prove beyond a doubt that the disease was endemic in character, and infectious. Animals were kept in cages and their diet controlled, as this gave the observers a far better opportunity to perfect the observations as to the infectiousness of cancer, and the results were of greater significance.

Pick, of Germany, discovered the endemic occurrence of cancer of the thyroid in brook-trout hatcheries. Bennett reports the same condition, it having occurred in the Tarbole hatchery on the Gardasee. In the Tarbole hatchery there was a destruction of 3000 trout from cancer of the thyroid. Pick farther states that when the fish were infected the disease was confined to individual tanks or pools. If fish free from infection were placed in these pools or tanks they soon acquired the disease. Heredity could not be considered as a factor, but that the disease was endemic and that the water of these pools or tanks must have contained the agent which produced the disease.

In 1904 Loeb carried forward a series of experiments with rats, desiring to prove the endemic nature of cancer, and the results produced, to his mind, were conclusive, viz., that the disease was endemic. After the completion of his experiments, the cages were sterilized, except two, and again filled with healthy rats secured from another part of the country. In due time the rats that had been placed in the unsterilized cages showed positive evidence of cystic sarcoma of the thyroid. The sterilized cages showed no evidence whatever of unhealthy rats. These experiments were carried on some six or more times, producing the same result. Doctor Loeb demonstrated sections of the primary and inoculation tumors at various times before scientific societies, and the consensus of opinion by all pathologists present was that the samples were true spindle-celled sarcoma. We must therefore consider these tumors as malignant.

From a scientific standpoint we could produce for your consideration a very large number of cases that would prove beyond question the theory of communicability and endemic nature of cancer.

I am looking forward to the time when we can and will have overcome what seems at the present moment to be an unsurmountable

difficulty; that is, a perfect knowledge not only of what cancer is, but its therapy. In the advance of intellectual progress, in the sunset splendor of the nineteenth century, there will be brought forward a panacea for this most dreaded disease, cancer. For a long time cancer has been looked upon as absolutely incurable, therefore the physician feels justified in making an unfavorable prognosis. The prognosis is true in a large number of cases, but is not caution necessary? A diagnosis by competent men may not always prove true. Again, cases of undoubted cancer have been known to retrograde, or remain at a standstill for a long time, while others have been practically cured. We have a number of cases reported where from a microscopical standpoint a diagnosis was made and yet recovery took place.

Numerous cases have been reported by Virchow, Senger, Mohr, Alsburch, Kroenlem, Bear, Lindner, Hahn, Osler and others, where recovery took place. At a medical society in London, Doctor Gould presented a patient who had apparently recovered, and yet, eight months prior to this time, seemed to be near death from recurrent mammary carcinoma, with glandular involvement and secondary deposits in the lungs. Doctor Beatson, at the British Medical Association, passed a photograph of a case of carcinoma in a woman who had been under his observation for six years. The evidence showed, per photograph, a removal of the breast by the surgeon's knife, but this was not the case. The entire mamma had disappeared, taking with it glandular enlargement of the axilla. The standing of the medical gentlemen referred to above is such that I cannot but accept their statement as true, and, if true, the carcinoma cells must have perished from poor nourishment or invasion of the fibroblast which compresses them. Believing this to be a fact, we are forced to admit spontaneous recovery.

Having discussed to some extent the vital point or cause of cancer, we now pass to the consideration of its treatment. I wish that it were possible in the light of scientific investigation to present you with a treatment that is tangible. The remedies that have been tested from a medical standpoint in number is legion, but their beneficial effects are of little or no real value. The early and free use of the surgeon's knife is of greater worth than all other remedies combined.

During the last few years the X-ray has been brought into use, and by some highly extolled, but upon investigation the experience of those more careful in their deductions does not warrant such a conclusion. Finsen light, with the X-ray, and radium, may be of

value in superficial cancer from their destructive action, but I do not see any advantage to be derived from their use in preference to the knife. In skin cancer they may be of use, but in the more deep-seated cancerous tumors the general opinion is that they are *nil*, and in many cases harmful, especially the X-ray. Science, in her effort to produce a cure, no doubt has caused many of the medical profession to be overzealous, and they have jumped at a conclusion as to the therapy of cancer.

Professor Doyn, of Paris, announced to the world that he had produced a serum that would immunize a patient with cancer. The French and English commission gave this serum a thorough investigation and the result proved that it was of no value. Coley, working along the same line, the germ theory, manufactured what is termed "Coley's Fluid," claiming that it was a specific. Further investigation, however, proved to the contrary. McElwain, in 1875, held that cancer was the result of high living. He believed that sugar was an active factor as a cancer producer, but to-day the profession makes the statement that there is a lack of sugar in the system, hence fill their patients with sugar.

Much more time and space could be expended in further citations and doubtless it would be of interest, but the results would be of little worth. The facts are, we might as well be honest and say, so far as the medical profession is concerned, we have no known remedy that could be termed a specific, and nothing equal nor superior to the early and free use of the surgeon's knife.

The objects of this paper are :

First.—To call your attention to the increased mortality each year from cancer.

Second.—To point you to the fact that failure has largely crowned our efforts to prevent the spread or cure the disease.

Third.—We have been taking into account the theory of heredity and placing too much stress upon it.

Fourth.—We have failed to recognize the fact that cancer is absolutely a local disease during the first stage.

Fifth.—That waiting to act is positively harmful, as it reduces the chances of life.

Sixth.—The ameba may remain in a dormant state for a long time if kept dry, and then under favorable conditions become active. Hence every room of a house occupied by a cancer case should be thoroughly disinfected before it is again occupied. The same restrictions must prevail as found to be necessary from any contagious disease.

Seventh.—Scar tissue or an ulcerated surface have less resisting power than the normal tissue, hence greater need for care.

Eighth.—Age also renders the individual less immune.

Ninth.—Operations performed after the disease has passed the local stage are of far less value and much more dangerous to the patient.